HIKVISION

360 Panoramic Surround View System
Calibration Scheme

HIKAUTO

科 技 呵 护 未 来

First Choice for Security Professionals

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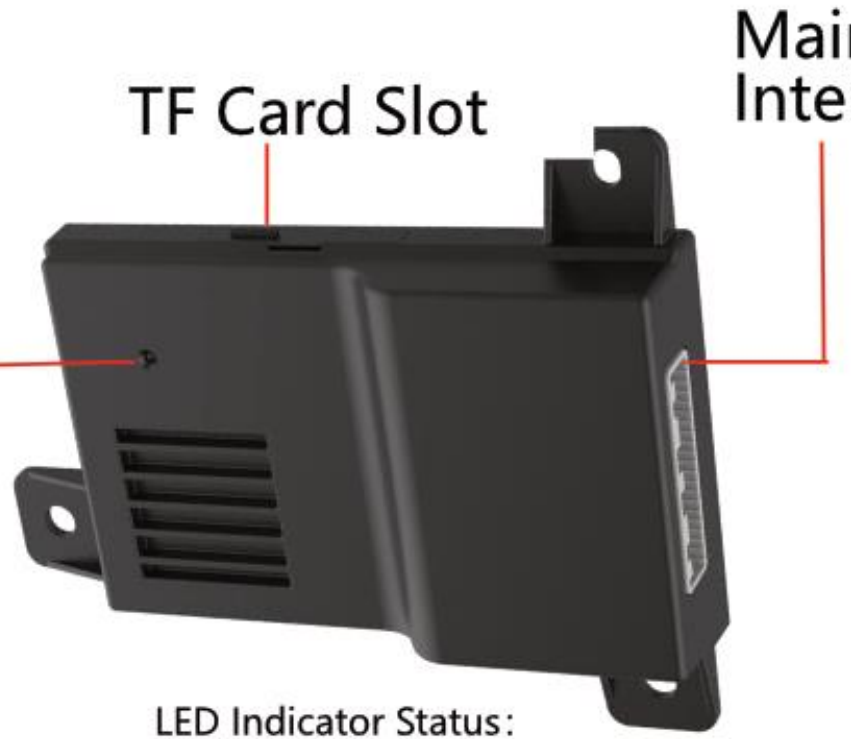
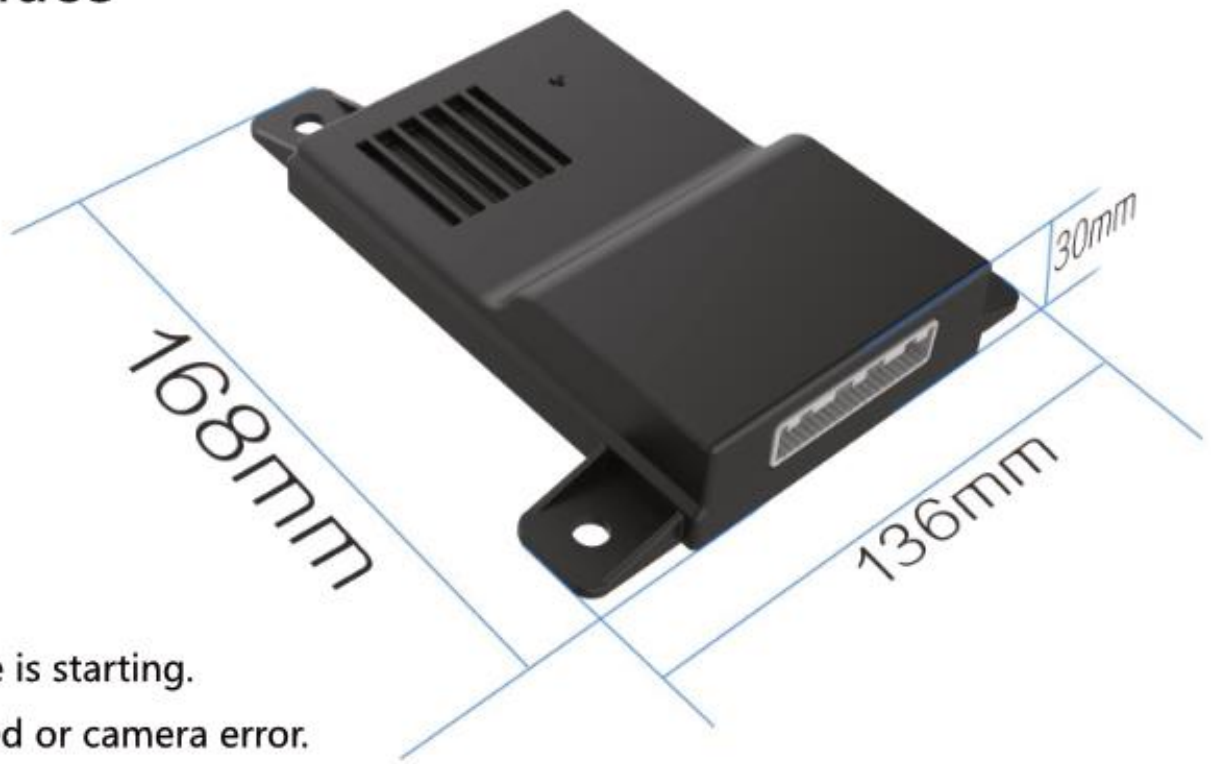
Product Introduction





LED Indicator Status:

Red and green flashing alternately- device is starting.

The red light flashes- Camera disconnected or camera error.

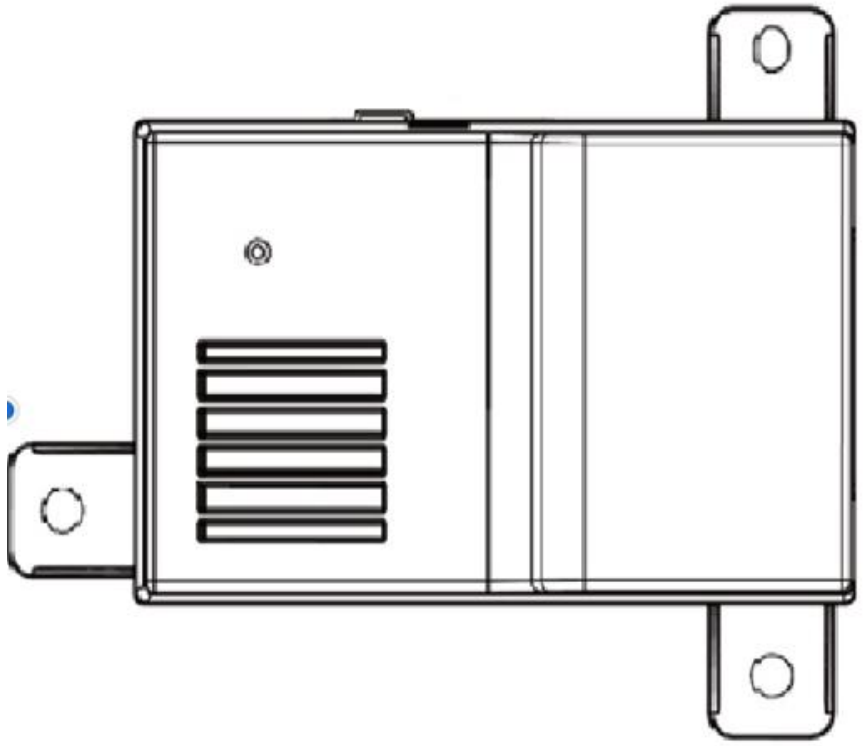
The red light flashes slowly- TF card not inserted, or TF card error.

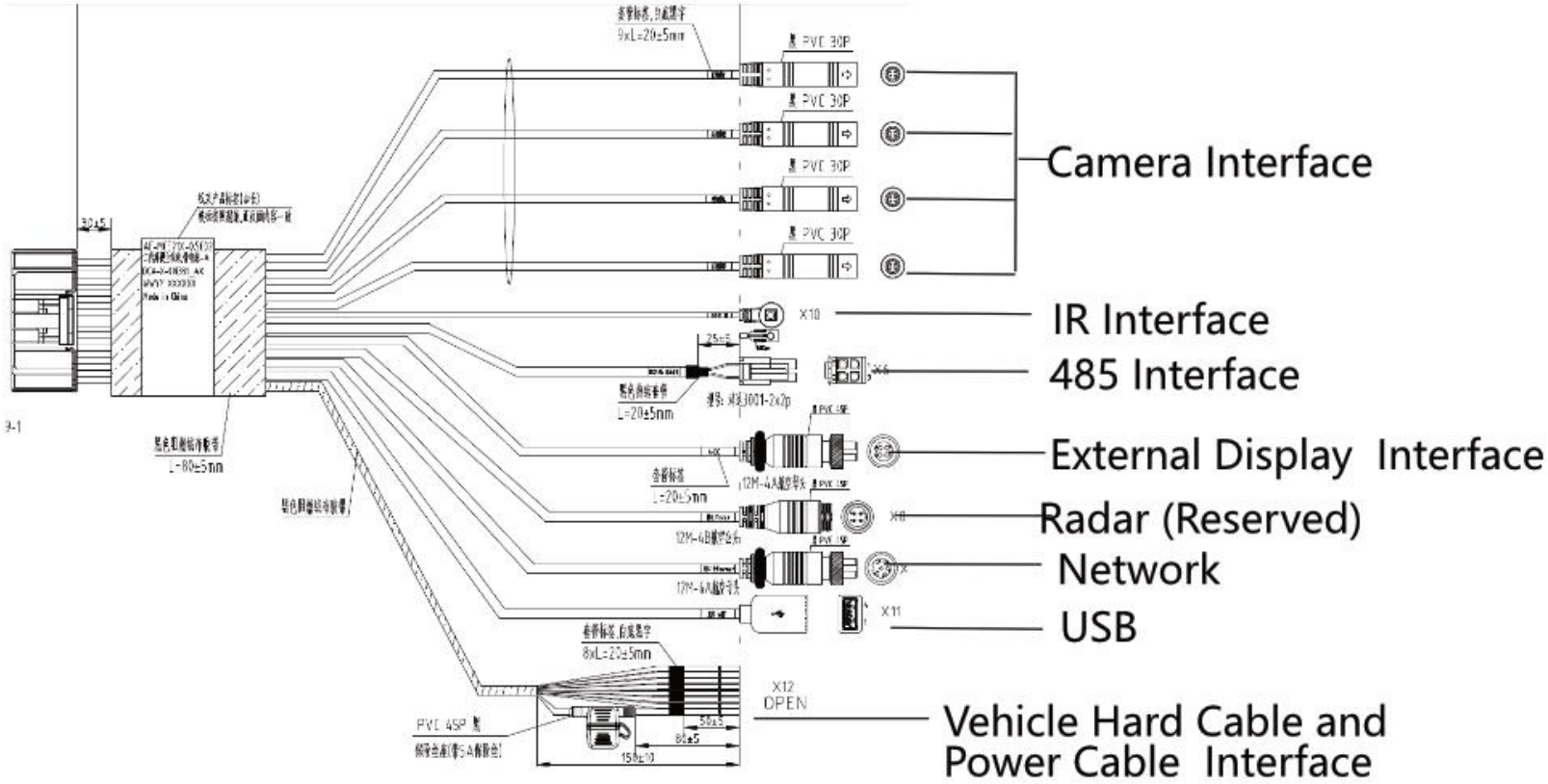
The red light is always on- Upgrading, green light flashing when finished.

The green light is flashing- Device working normally.

Product Introduction

External Interfaces





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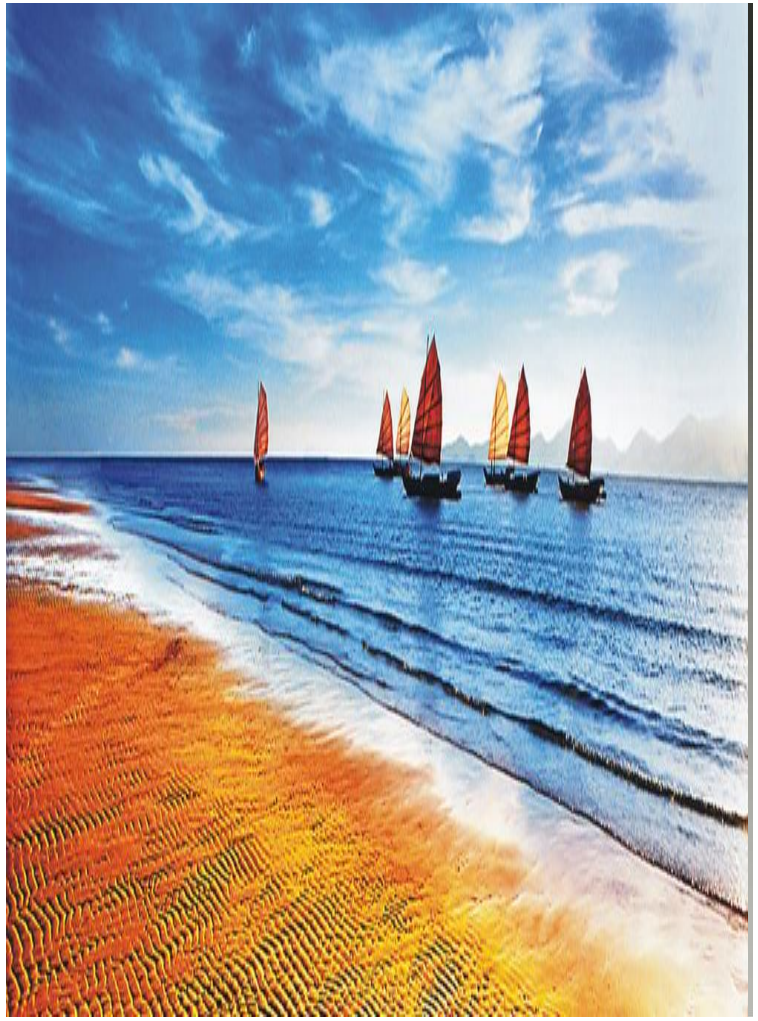


Installation Preparation

Device Installation

Calibration Steps

Installation Preparation

- Tools Preparation
- Tools for installation:

PC, calibration cloth, screw driver, electric drill, Electrical tape, tape measure, TF cards

How to get calibration cloth:

1. Static vehicle line：
   - A、Online shopping (Alibaba International)
   - B、Spray
2. You can get homocentric square cloth at the print shop

- Tools for calibration: remote control, Wi-Fi module, card reader

Calibration Preparation

HIKAVM calibration and remote control calibration

Insert the Wi-Fi module into the cable interface so that HIKAVM can connect the device to be calibrated.

HIKAVM Icon

- HIKAVM calibration

Insert the accompanying Wi-Fi calibration, open Wi-Fi on the cellphone and connect to the hotspot of “HIKAUTO-360****”.

Scan to Download HIKAVM

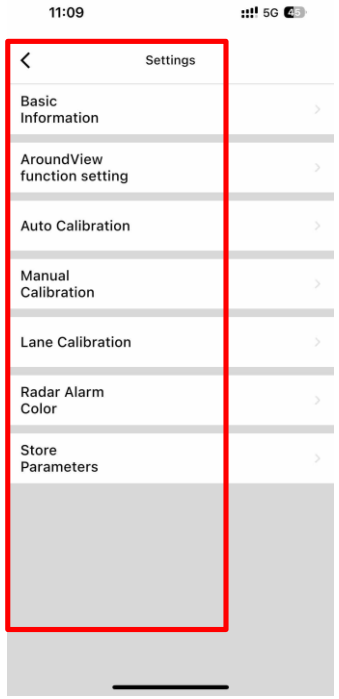
Android IOS

- Remote Control Calibration

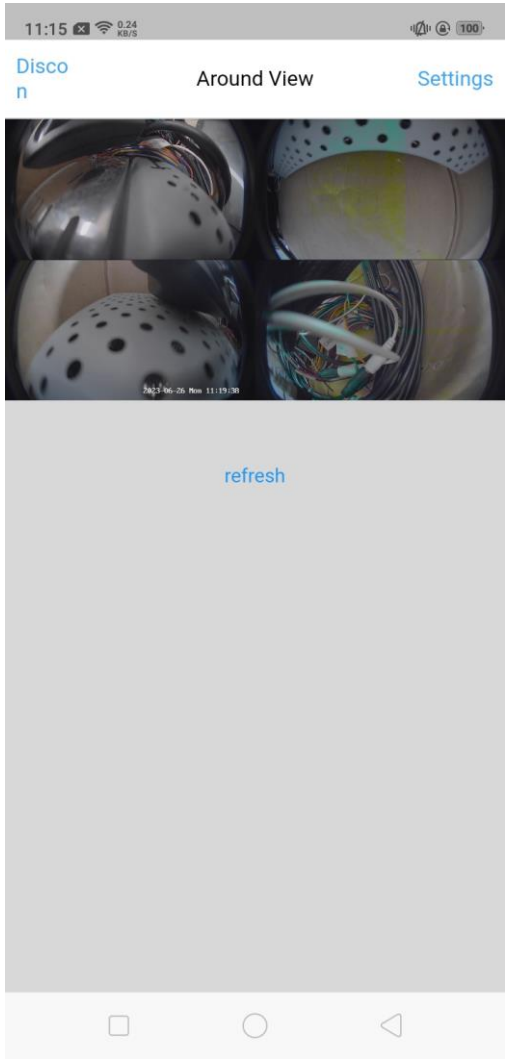
Use the accompanying remote control and aim at the signal receiver of the host.

Calibration Method 1—through Calibration APP

Open Calibration APP and the right side interface will appear. You can view the preview image and connect/disconnect the connection, and set parameters.



Level 1	Level 2	Level 3
Basic Information	Device and Storage Information	/
AroundView function setting	Full Screen Switch for Rear View	On/Off
	Front Track Line Switch	On/Off
	Rear Track Line Switch	On/Off
Auto Calibration	Vehicle Body Parameters	Calibration Field Parameters
Manual Calibration	Vehicle Body Parameters	Calibration Field Parameters
Lane Calibration	Lane Calibration Param Setting	Starting Interface of Calibration
Radar Alarm Color	Radar Alarm Level Choice	Color Setting for all Levels of Alarm
Store Parameters	Calibration Param Operation	/



Calibration Method 2—Remote Control Calibration

Name	Function
	Long press to restart
MENU	Menu
TEST	2D/3D view switch
	“Up” in the menu
	Play the previous video in the playback interface
	Back to previous action
	“Page Up” in the menu
	“Slow motion” in the playback interface
	“OK” in the menu
	“Play/Pause” in the playback interface
	“Page Down” in the menu

0	For date/time setting
	“Down” in the menu
	Play the next video in the playback interface
C	In the preview interface, switch output standard
1	For date/time setting
	On 2D/3D view, switch to front view
2	For date/time setting
	On 2D/3D view, switch to back view
3	For date/time setting
	On 2D/3D view, switch to left view
4	For date/time setting
	On 2D/3D view, switch to right view
5	For date/time setting
6	For date/time setting
7	For date/time setting
8	For date/time setting
9	For date/time setting

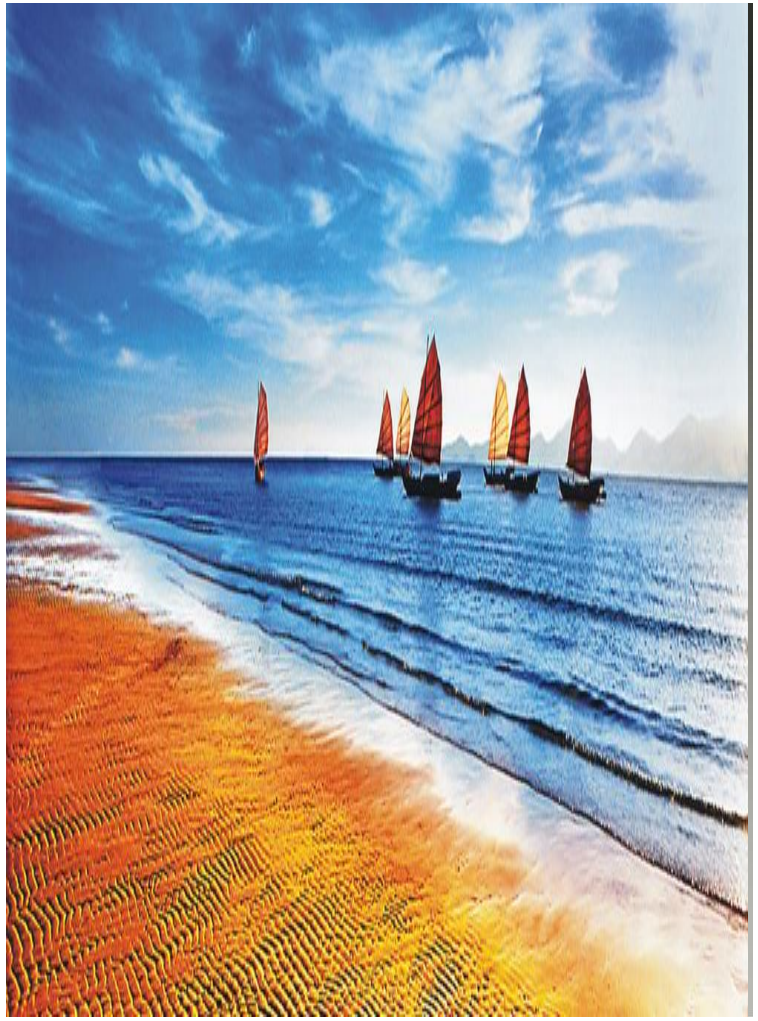
Calibration Method 2—Remote Control Calibration

➢ GUI

Press “MENU” to show menu options

Level 1	Level 2	Level 3
Settings	Distortion Correction	ON/OFF
	3D Display	ON/OFF
	Car Model Settings	Bus/Car/School Bus/Others
	Screen Output Format	TVI/AHD/CVBS
	Screen Display Format	PAL / NTSC
	Camera Type	TVI/AHD
	Factory Reset	ON/OFF
	Format Storage	ON/OFF
	Date/Time	Settings
	Plate Settings	Please enter the plate information/Delete/OK
	Video Bit Rate	1/2/4/6M
	Front Trajectory	ON/OFF
	Rear Trajectory	ON/OFF
	Video Output Resolution	720P/1080P
	Camera Resolution	720P/1080P
Playback	Ordinary Recordings	All stored recordings
Device Information	System and storage	/

Chapter 2 Calibration Method



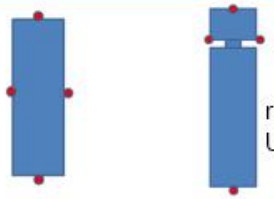
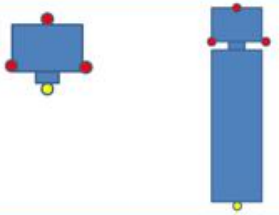
Installation Preparation

Device Installation

Calibration Steps

Device Installation

Installation Position for Different Types of Vehicles

4-Channel Stich	3-Channel Stich
 rear cam should not be installed Under the dump box	 rear cam should be installed Under the dump box
Suitable for all-in-one vehicles less than 13 m: bus, coach, School bus, sanitation car, concrete car.	Suitable for front the heavy truck, muck car
1.4 fish-eye cameras for 360° stich 2. Left and right cameras can be installed either on the side of vehicle head or body	1.3 cameras(red) stich+1 rear camera (yellow) for 270°+rear view 2. All 3 cameras are installed on the vehicle front rather than body.
 	 
 	

Device Installation

- Device Installation
  - Choose a smooth surface for installation
  - Avoid protruding things to block the camera view
    - If the backing camera is already installed at the top place of the vehicle rear, then install the around rear view camera under the backing camera

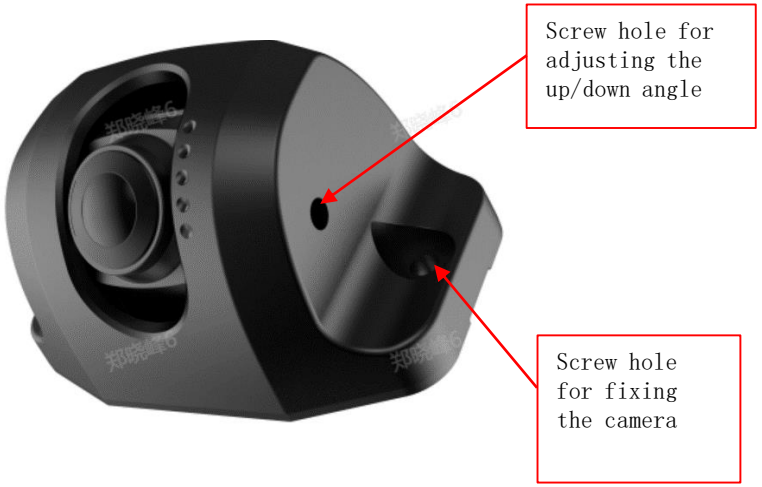
Front view camera at the top middle of the vehicle front

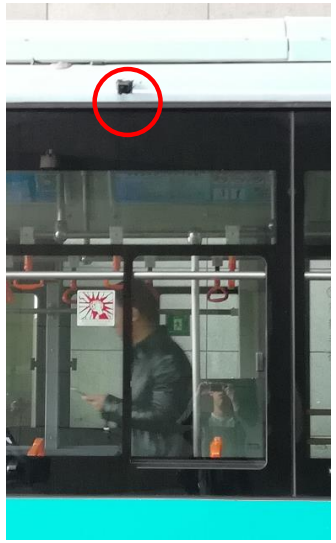
Left/Right view camera at the top middle of the vehicle middle

Rear view camera at the top middle of the vehicle rear

Device Installation

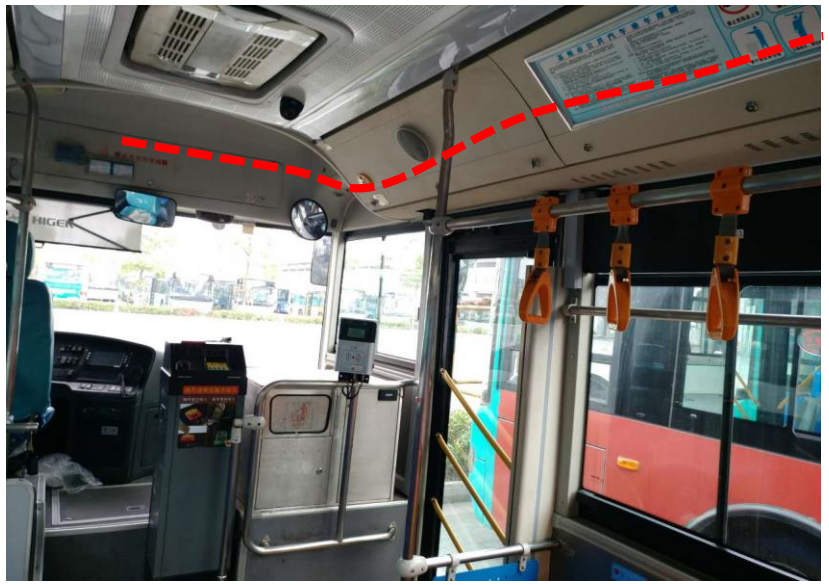
- Camera Fixation
- For each camera:
  - Drill 2 screw holes, must be parallel to each other to avoid preview angle inaccuracy
  - Drill 1 cable holes for the camera cable wiring
    - Use tapping screw to fix the camera bracket on the vehicle body
    - Use the camera extending cable to wire the cable through the cable hole.
    - Apply water proof glues for all the holes





Device Installation

- Camera Wiring
- Connect the female end of the extending cable with the camera
  - For the bus, wire the extending cable on the top of the vehicle, usually inside the hidden box.
  - Ask the professional electrician for help.



Device Installation

- Camera Angle Adjustment
  - When adjusting the camera angle, make sure that the bottom of the preview image covers up to 10% of the vehicle body to avoid blind spot.
  - Make sure that the images are complementary on the left and right.

Device Installation

- Installation of the host
  - Connect cameras to the extending cables
  - Power on
  - Connect the video-out cable to the screen (TVI/AHD screen or DVR)
  - Check whether the image out put of the 4 cameras.

Cable Description	Color	Vehicle Cable
Power	Red	Stable electricity
Ground	Black	Ground
ACC	Yellow	ACC

Device Installation: Muck Car Camera

- Choose a smooth surface for installation
- Avoid protruding objects that blocks the camera view
  - If the backing camera is already installed at the top place of the vehicle rear, then install the around rear view camera under the backing camera
- Make sure that the 4 cameras are of the same height and stay in the middle position.

放在车顶

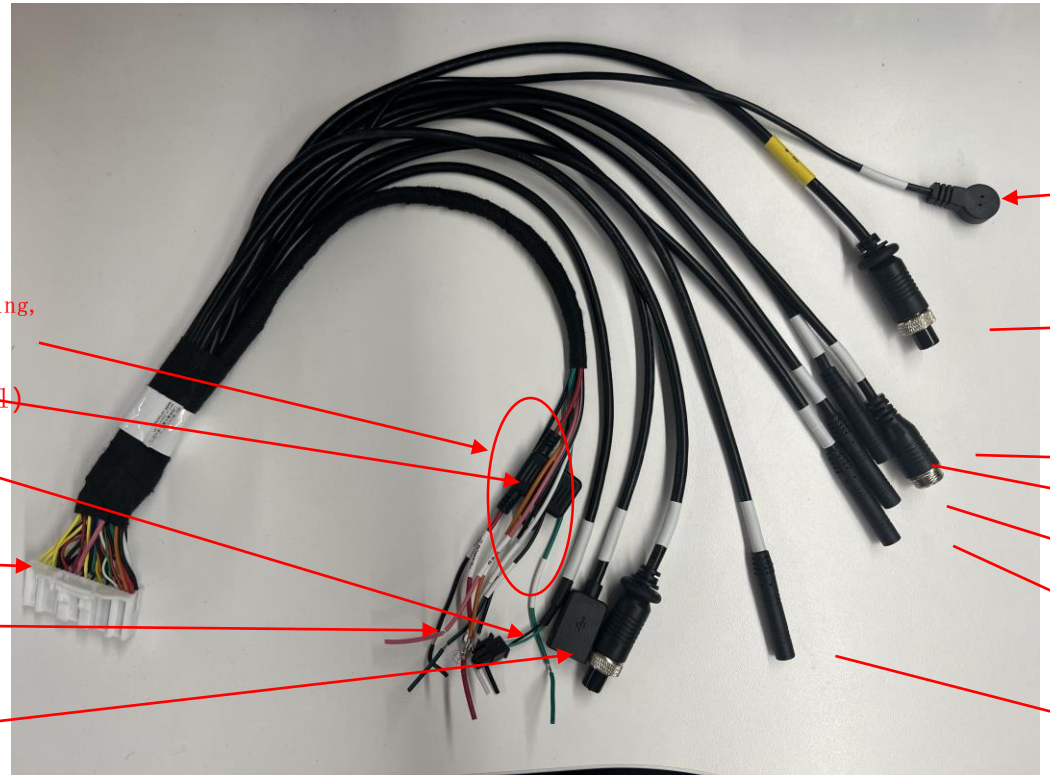
放在LOGO处

Device Installation: Concrete Car Camera

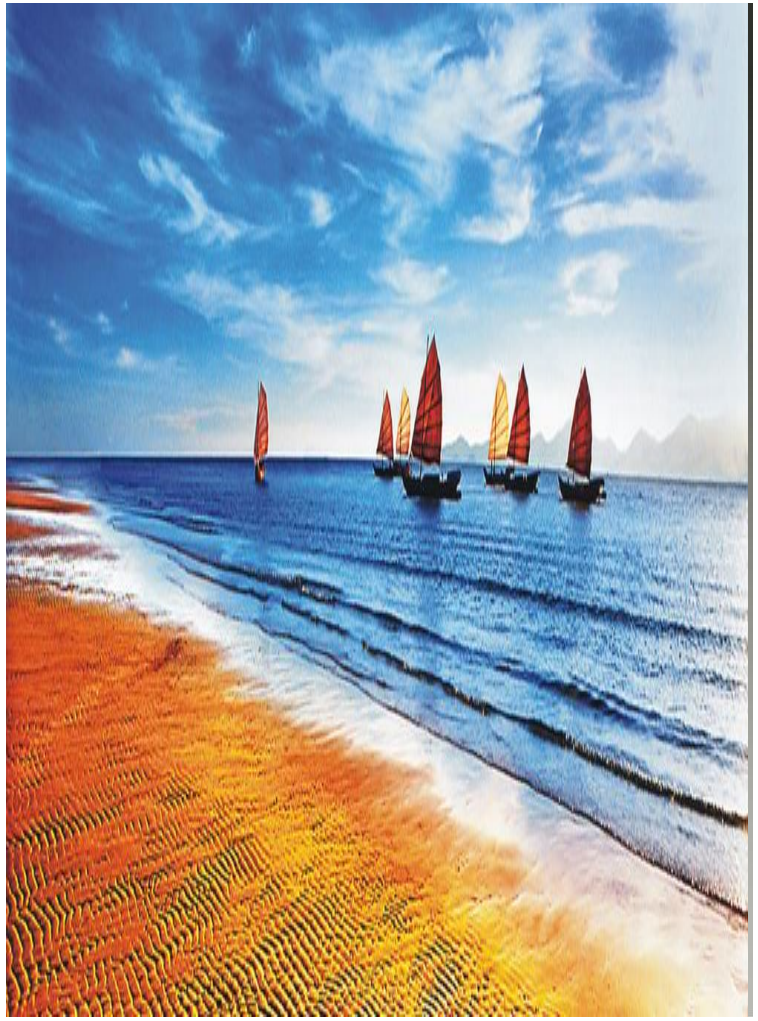
- Choose a smooth surface for installation
- Avoid protruding objects that blocks the camera view
  - If the backing camera is already installed at the top place of the vehicle rear, then install the around rear view camera under the backing camera
- Make sure that the 4 cameras are of the same height and stay in the middle position.

Device Installation: Around View Host Installation

- Choose a suitable position (the weak box recommended) in the front area of the car body to place the host.
- The 4 extension lines are respectively connected with the 4 camera connection lines on the cable of the around view host (the harness of the around view host is marked with the connection marks of the front, rear, left and right cameras).
- The video output line can be connected to the display screen or the XVR host, and the power line is connected to the body power supply.
- The signal wires of the car body are respectively connected to the signal terminals of the car body.



Chapter 2 Calibration Method



Installation Preparation

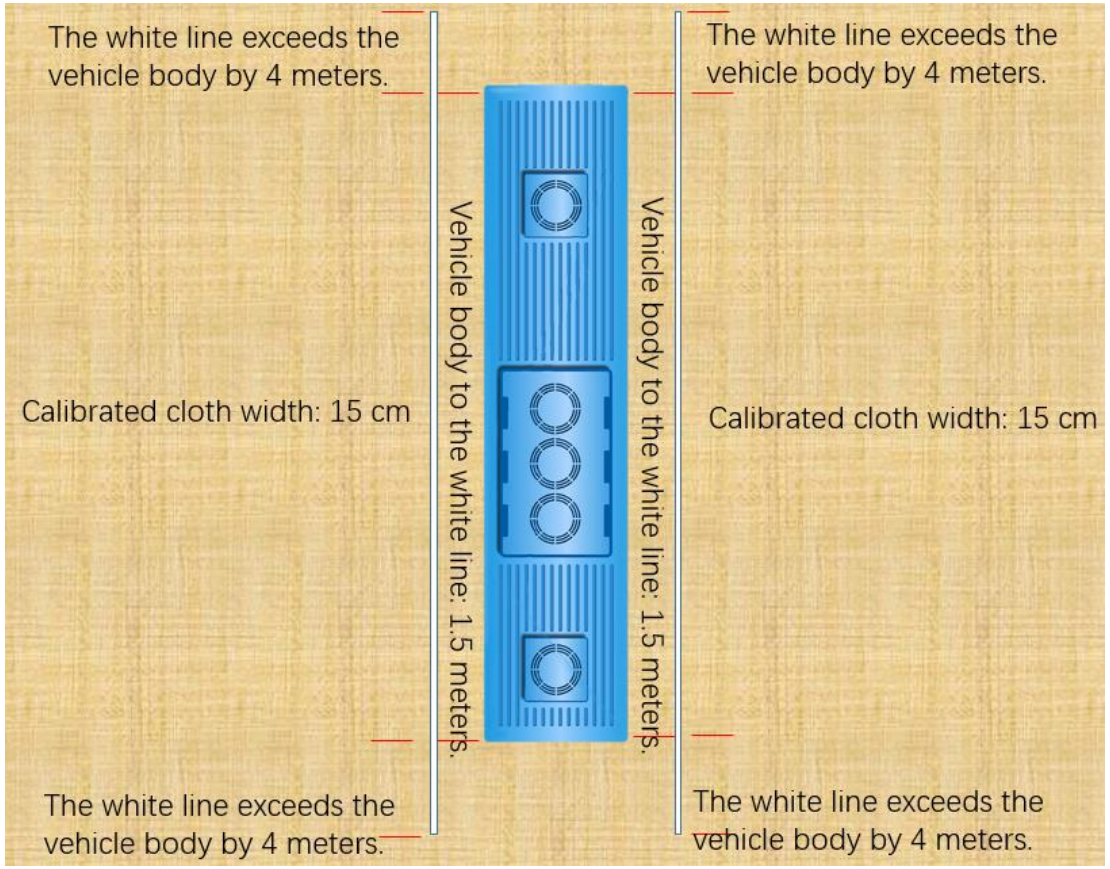
Device Installation

Calibration Steps

Calibration Preparation-Static calibration (road lane calibration)

- Calibration cloth preparation
- Requirements for calibration cloth: as shown in the figure on the right (rectangular calibration cloth)
- The criteria are as follows:
- Width 15 cm

- Site requirements: leveling.
- Camera installation position: right in the middle of the car body, at the top of the car.
- Camera installation angle: the lower edge of the field of view is tangent to the car body,
- Symmetry left and right.
- Cameras should be installed at the same height as possible to achieve the best stitching effect. (Self-assessment can be made according to the vehicle type)
- The camera is firmly installed to ensure that it will not be loose after use.
- How to obtain static lane lines:
- 1. Online shopping (Taobao/Ali International Edition, etc.)
- 2. Painting and scribing can be used.

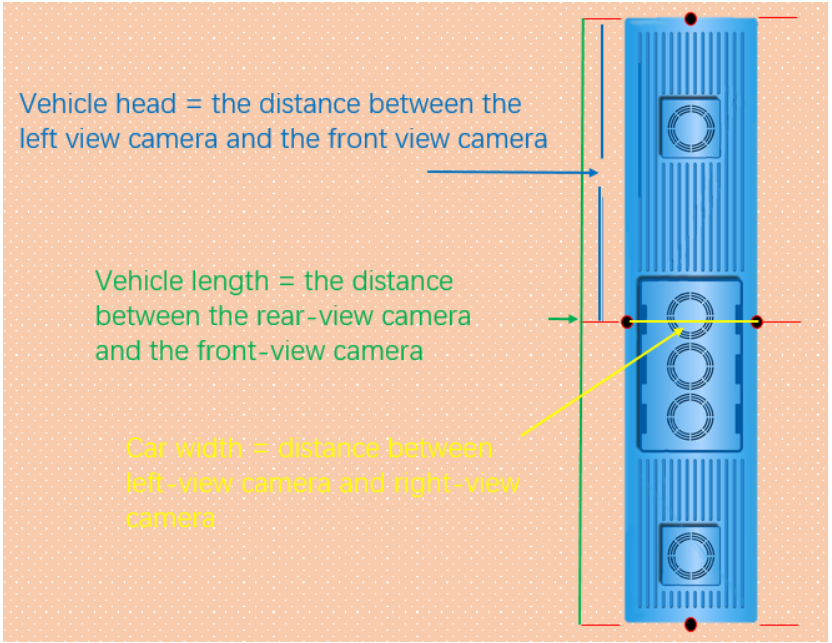


Placement Requirement for Calibration Cloth

Parameters for Static Road Calibration

Static road calibration is a scheme to determine the calibration by paving two lane lines in the field. For the placement requirements of lane lines, please refer to the placement requirements of static calibration cloth.

Definition	Requirement
Vehicle Length	Length of the Vehicle: usually the distance between the front and rear camera
Vehicle Width	Width of the Vehicle: usually the distance between the left and right camera
Front camera height	The ground clearance of the forward-looking camera
Rear camera height	The ground clearance of the rearview camera
Left camera height	The ground clearance of the left-looking camera
Right camera height	The height above the ground of the right-looking camera.
The distance between the left camera and the front of the car	Note: This generally refers to the horizontal distance between the left-looking camera and the forward-looking camera, not the straight-line distance.
The distance between the right camera and the front of the car	Note: This generally refers to the horizontal distance between the right-looking camera and the forward-looking camera, not the straight-line distance
Confirm	Click to enter the calibration interface. Note: Do not perform other operations while calibration. After waiting for the progress to reach 100%, the calibration is successful and automatically jumps back to the preview interface



➢ Calibration preparation: dynamic calibration

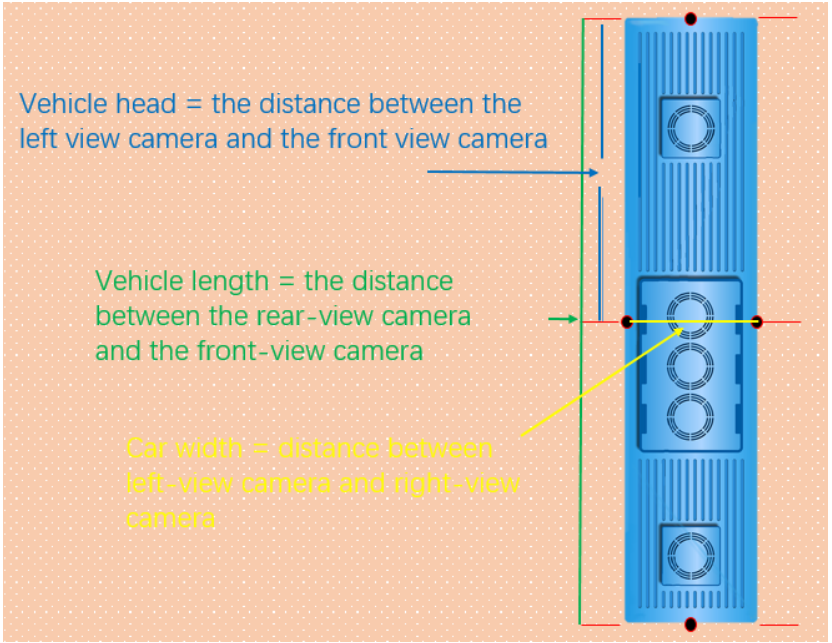
- Calibration cloth preparation
- Requirements for calibration cloth: No calibration cloth (just use lane width).
- The criteria are as follows:
- Try to calibrate on a long solid line and the vehicle speed is between 0 km/h and 30 km/h.
- Intersections and virtual and real lines have no influence.

- Site requirements: leveling.
- Camera installation position: the highest vertical center line on all sides of the car body.
- Camera installation angle: the lower edge of the field of view is tangent to the car body,
- Symmetry left and right.
- Cameras should be installed at the same height as possible to achieve the best stitching effect.

Parameters for Dynamic Road Calibration

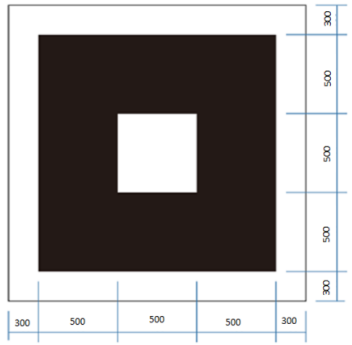
Dynamic road calibration is a scheme that is calibrated after driving in the outfield. For off-site driving scenes, lane lines, vehicle speeds and other requirements, please refer to the calibration preparation requirements.

Definition	Requirement
Vehicle Length	Length of the Vehicle: usually the distance between the front and rear camera
Vehicle Width	Width of the Vehicle: usually the distance between the left and right camera
Front camera height	The ground clearance of the forward-looking camera
Rear camera height	The ground clearance of the rearview camera
Left camera height	The ground clearance of the left-looking camera
Right camera height	The height above the ground of the right-looking camera.
The distance between the left camera and the front of the car	Note: This generally refers to the horizontal distance between the left-looking camera and the forward-looking camera, not the straight-line distance.
The distance between the right camera and the front of the car	Note: This generally refers to the horizontal distance between the right-looking camera and the forward-looking camera, not the straight-line distance
Confirm	Click to enter the calibration interface. Note: Do not perform other operations while calibration. After waiting for the progress to reach 100%, the calibration is successful and automatically jumps back to the preview interface



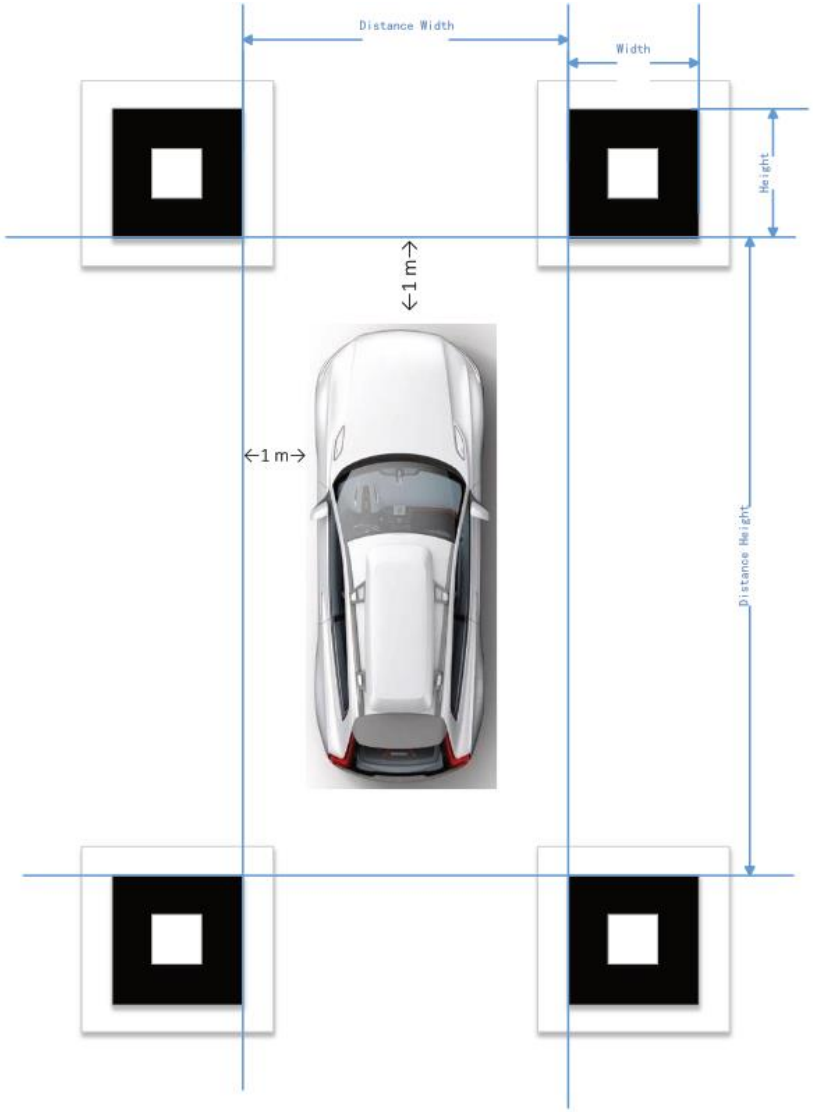
Calibration Preparation: Homocentric Square Calibration

- Calibration cloth preparation
- Requirements for calibration cloth: as shown on the right (standard square).
- The criteria are as follows:
- The bigger the calibration cloth, the stronger the anti-interference.
- Material: non-woven fabric is recommended.
- Site requirements: leveling.
- Camera installation position: the highest vertical center line on all sides of the car body.
- Camera installation angle: the lower edge of the field of view is tangent to the car body,
- Symmetry left and right.
- Cameras should be installed at the same height as possible to achieve the best stitching effect. (Self-assessment can be made according to the vehicle type)
- The camera is firmly installed to ensure that it will not be loose after use.



Material: non-woven fabrics
Length of the whole cloth: 2.1 m
Black side: 1.5 m
Unit in the figure: mm

Calibration Preparation: Homocentric Square Calibration (Parameters Settings)

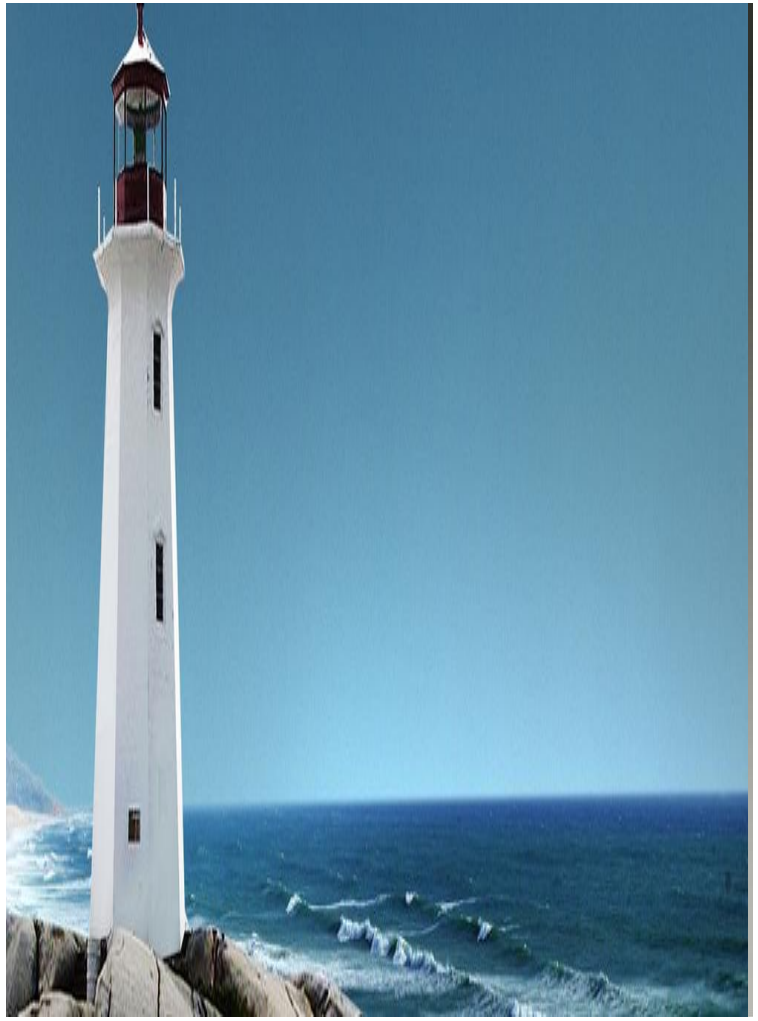


- Layout of calibration cloth site: as shown in the figure. Requirements: 4 cameras can see the calibration cloth normally. The calibration cloth is parallel and symmetrical up and down, left and right, and the center of the vehicle coincides with the center of the calibration cloth.

- Data measurement:

1. Body parameters. (There are positive and negative values)
2. Camera height.
3. Site parameters.
4. Calibrate cloth parameters.
5. It is recommended to give priority to automatic calibration.
6. Generate calibration results.

Introducing Calibration



Remote Control Calibration

App Calibration

Remote Control Operation

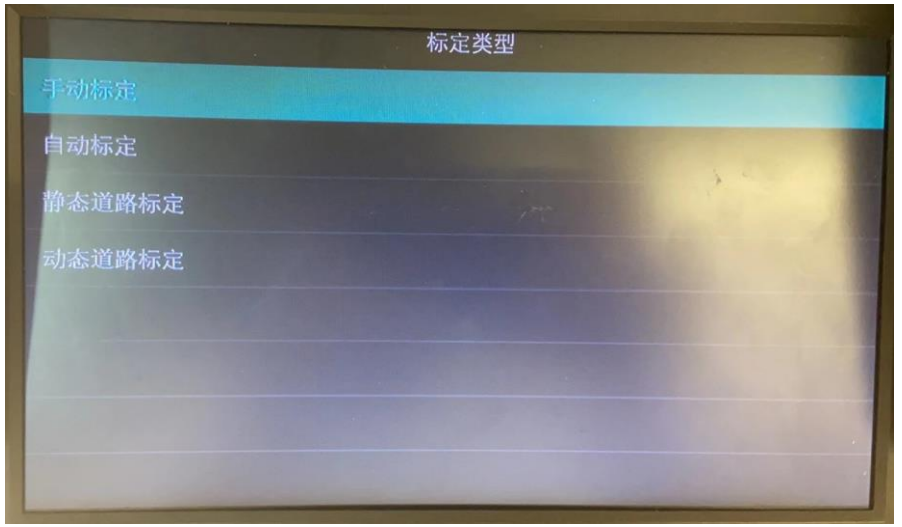
1. Press "1", "2", "3" and "4" to switch the viewing angle.
2.(menu) key to enter the menu.
3. Menu +666666 enters the calibration interface.
4. You can view and adjust the video output formats (AHD, TVI, CVBS) of the equipment.
5. You can switch between 2D and 3D display by "test" key.
6. The device can be operated to "format the memory card"
7. Press and hold the power button to restart the device.
8. Can view the equipment information, version number, etc.

Calibration Steps

After confirming that the calibration cloth and camera position are correct:

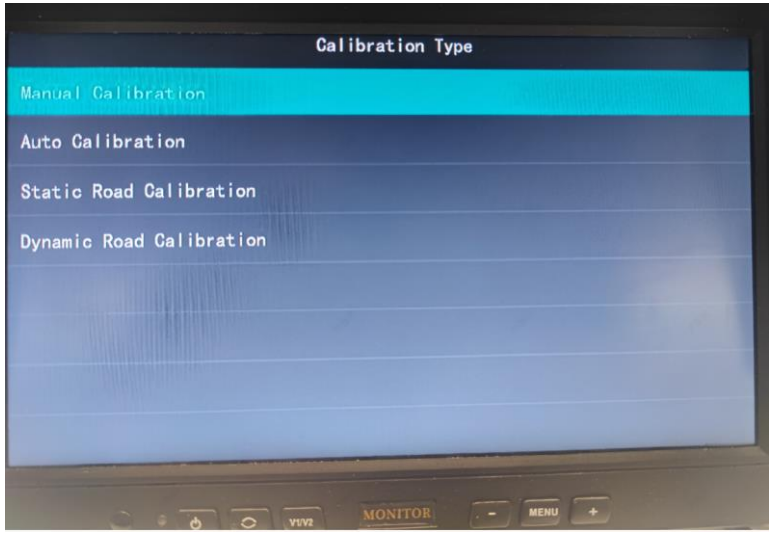
1. power on the equipment
2. press the "1", "2", "3" and "4" keys through the remote control to view the perspectives of the front, back, left and right cameras respectively.
3. Press "TEST" to switch between 2D effect and 3D effect.
4. Make sure that the original image of each viewing angle can see the calibration cloth.

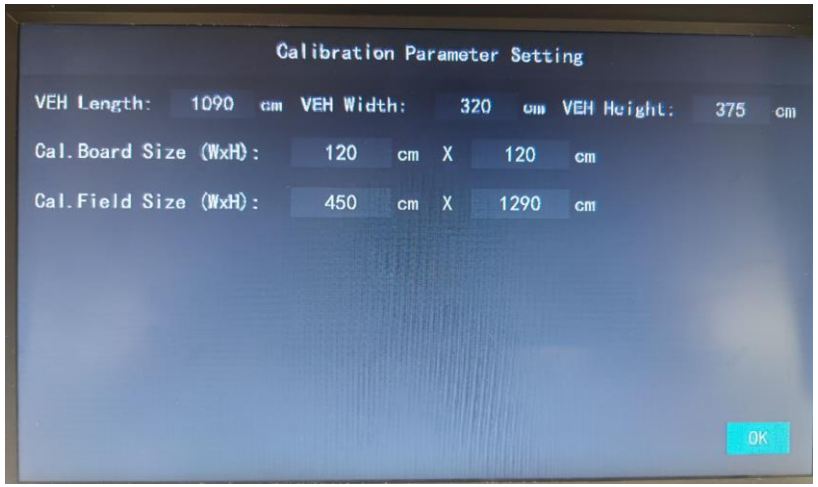
Press the "MENU" button of the remote control, click the number "6" six times, and then press the number "3" to enter the calibration mode selection.



Static Road Calibration

- Static road calibration is a scheme of setting 2 lane lines in the field and then calibrating.
- When selecting static road calibration, it is necessary to use the calibration cloth imitating the road route. The distance between the car body and the white line is 150cm, and the length of the white line exceeds 400cm before and after the car body. After confirming that the calibration cloth is correctly placed, you can point to this interface for static road calibration.
- Having set the calibration parameters in the static road calibration setting, wait for 3 minutes and return to the main interface.



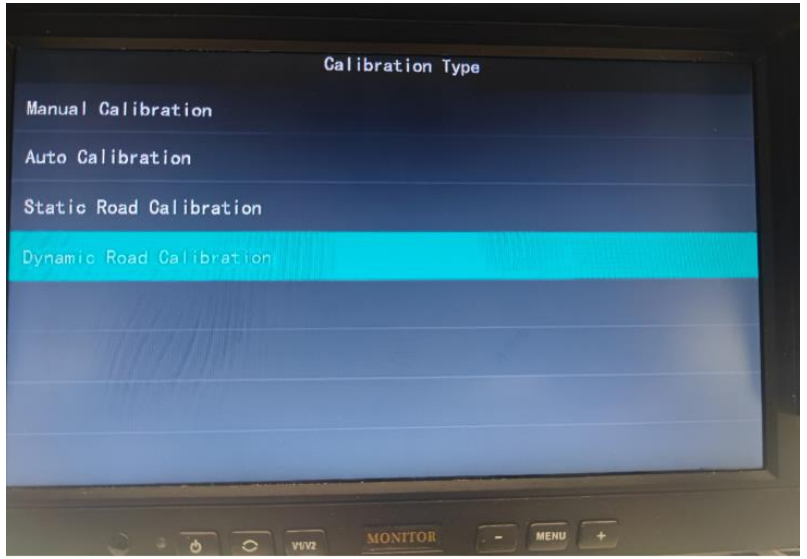


Dynamic Road Calibration:

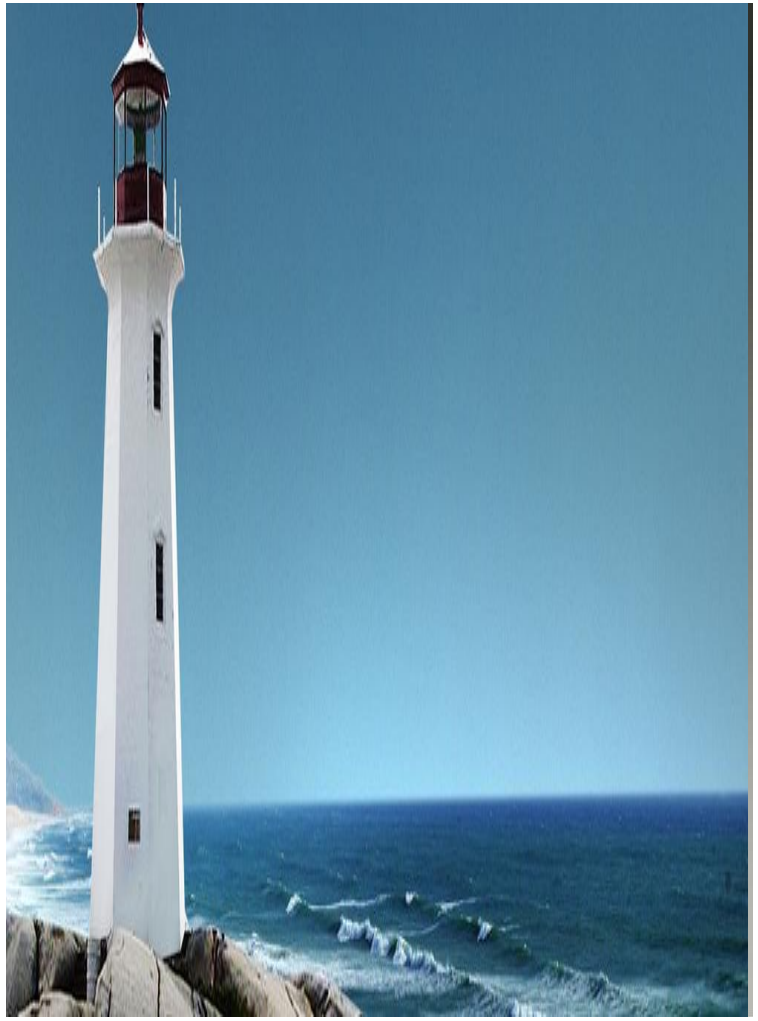
- Dynamic road calibration is a scheme in which calibration happens when the vehicle runs on the outer area.

- In the process of dynamic calibration, the vehicle needs to be calibrated when driving at a constant speed of 0-30KM/h, and it can be calibrated automatically in a few minutes.

- Intersections, solid and dotted lines encountered in the calibration process will not affect the calibration. 。



Introducing Calibration

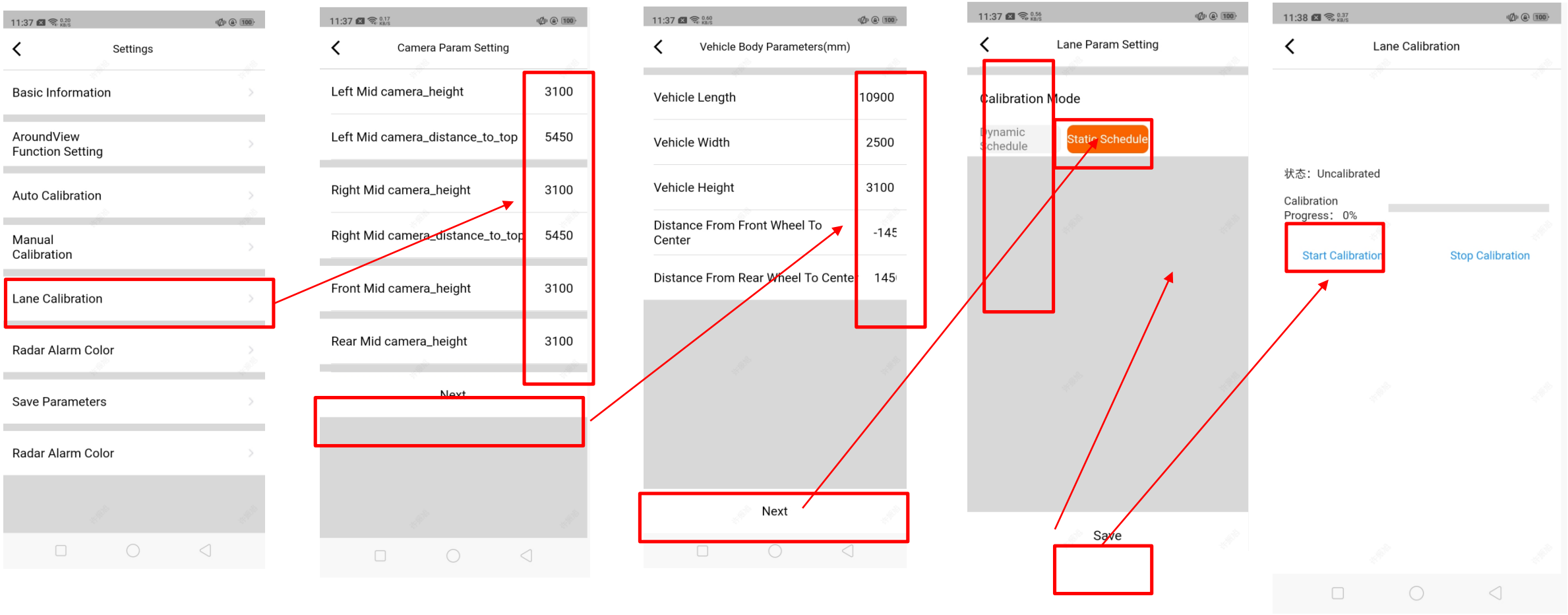


Remote Control Calibration

App Calibration

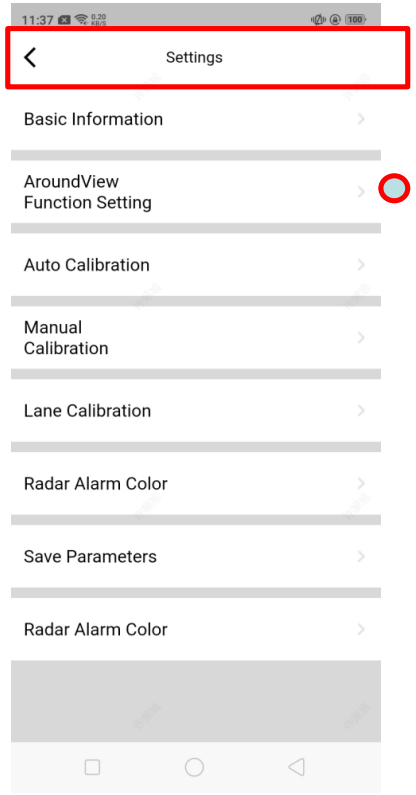
调试app操作

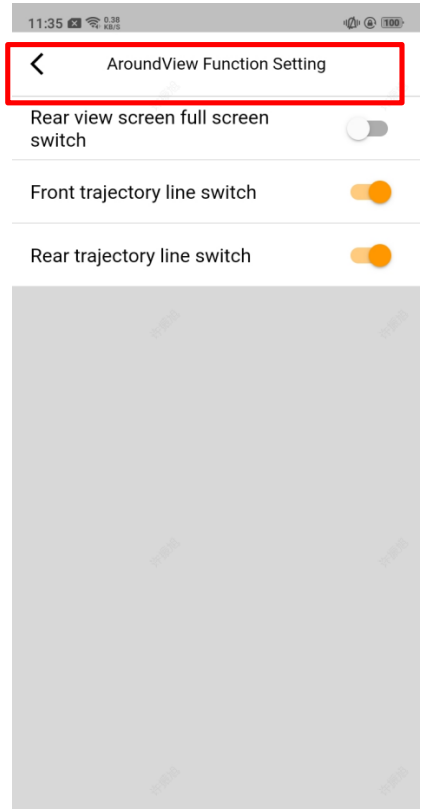
Insert the Wi-Fi module into the USB interface so that you can connect to the Wi-Fi with your phone. Enter the calibration interface of the app and enter the parameters according to your static/dynamic calibration needs, and then tab start calibration.

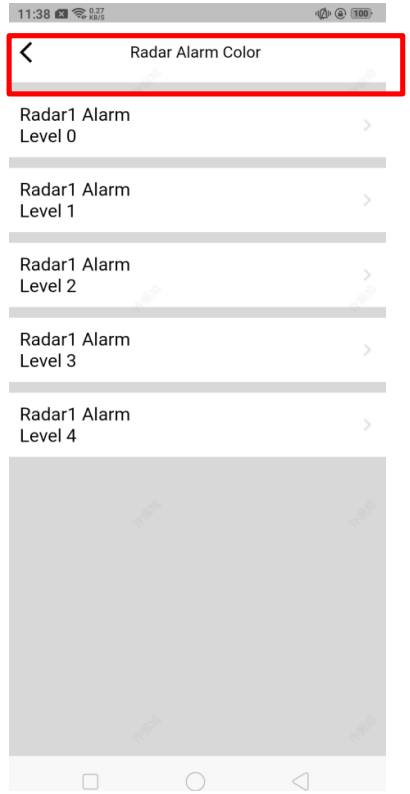


调试app操作

You can also set other parameters in the app.







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科 技 呵 护 未 来

First Choice for Security Professionals

Upgrading

1. Factory.bin: uboot upgrade package/firmware package
2. Digicap. dav: online upgrade package

Upgrade time: 5 minutes.

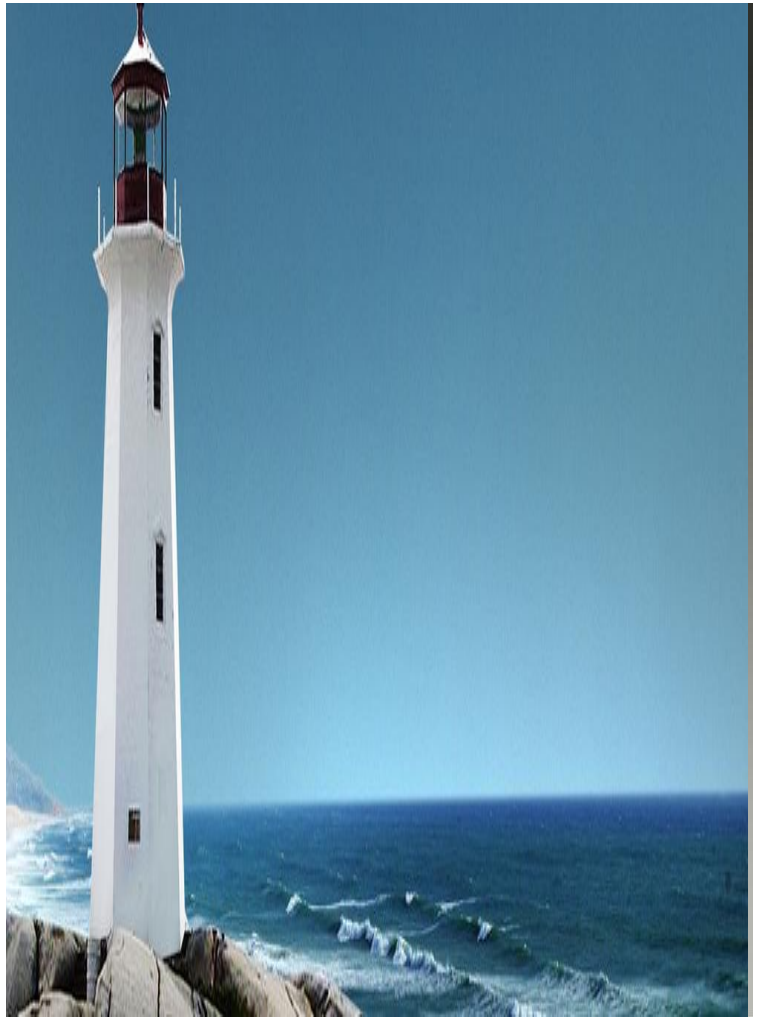
Uboot upgrade:
Copy the factory.bin into the root directory of tf card,
Insert the TF card
Power on the device again (no upgrade prompt).
factory.bin needs to be deleted manually.

Online upgrade:
Copy digicap.dav into the root directory of TF card, the device will recognize the upgrade package, and the GUI will prompt the upgrade choice for the user. Upgrading progress will be displayed and the upgrade package will be automatically deleted.

Note: heartbeat is not detected within 5 minutes after the equipment is re-powered, and uboot upgrade is supported. Normal heartbeat is 25 seconds.

There is no limit to the capacity of tf card

Chapter 3 Usage



Remote Control Calibration

App Calibration

Upgrading

Maintenance

FAQ about Preview Images

(1) Split Screen:

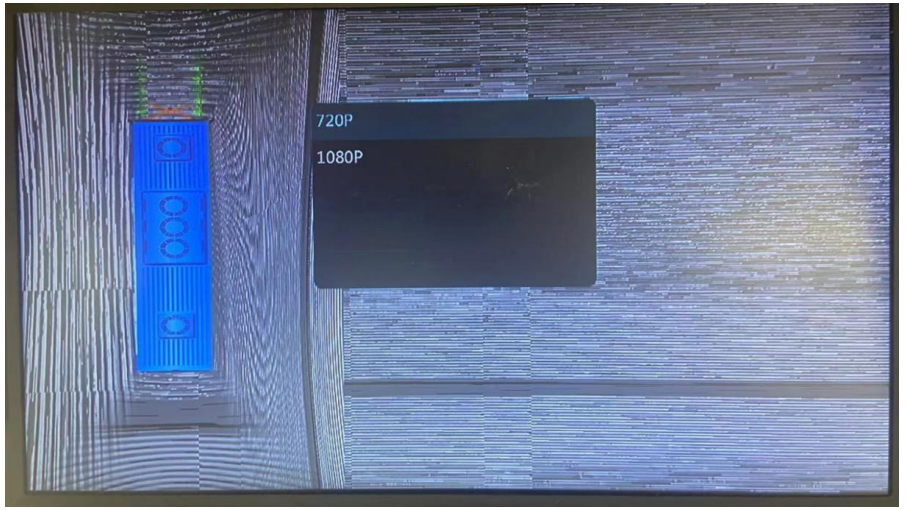
Cause: the mismatch between the camera standard and the 360 host.

Solution: on the remote control, press Menu->Settings->Camera Type, and switch between AHD/TVI to find the corresponding camera standard.

(2) Blurred Screen

Cause: the mismatch between the camera resolution and the 360 host.

Solution: on the remote control, press Menu->Settings->Camera Resolution, and switch between 720P/1080P.



FAQ about Preview Images

(3) Black/White Image of the Screen

Cause: the mismatch between the screen output standard of the around view controller and the 360 host.

Solution: on the remote control, press Menu->Settings->Screen Output Format, and switch among AHD/TVI/CVBS to find the corresponding screen output standard.

(4) Black/White Image of the Camera

Cause: the mismatch between the resolution of the camera and the 360 host.

Solution: on the remote control, press Menu->Settings->Camera Type, and switch between AHD/TV to find the corresponding camera standard.

HIKAUTO

THANKS

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